

**TOTAL RETENTION
SANITARY SEWER LAGOON CALCULATIONS**

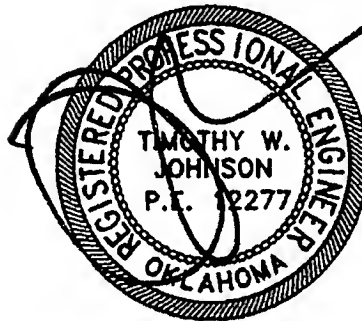
TO SERVE

CARLTON LANDING

LOCATED NEAR

Eufaula, Oklahoma

S-30601



*9/18/10
Call for: S-30601
Tyler will get info to me.*

July 29, 2010

RECEIVED

JUL 30 2010

DEQ ECLS

Prepared by:

JOHNSON & ASSOCIATES, INC.

1 East Sheridan, Suite 200

Oklahoma City, Oklahoma 73104

(405) 235-8075

(405) 235-8078*Fax



*Letter Sent
9/28/10*

J O H N S O N
a s s o c i a t e s



1 East Sheridan Avenue
Suite 200
Oklahoma City, Oklahoma 73104
405-235-8075 • FAX: 405-235-8078

April 18, 2012

Oklahoma Department of Environmental Quality
707 N. Robinson
Oklahoma City, OK 73101

Attention: Ms. Wendy Sheets

Re: **Carlton Landing Sanitary Sewer Lift Station and Lagoon Liner
(Facility No. S-30601)**

Dear Ms. Sheets:

Johnson & Associates has inspected the Carlton Landing sanitary sewer lift station and the lagoon liner and have found that both were constructed in accordance to the approved plans and specifications that were approved by ODEQ and permitted by permit No. ST000061110460 on January 23, 2012.

Respectfully Submitted,

Timothy W. Johnson, P.E.
JOHNSON & ASSOCIATES, INC.

TWJ/rw
Attachment(s)
cc: Tyler Muzny, P.E.
2732.000 / C

RECEIVED
APR 20 2012
DEQ ECLS



August 16, 2010

Ms. Wendy Sheets
ODEQ
707 N. Robinson
OKC, OK 73101

RE: Carlton Landing Confirmation of Ownership

Dear Ms. Sheets:

As the owner of Carlton Landing, on behalf of Humphreys Partners 2009, LLC, Johnson & Associates, Inc. is authorized to act as our agent for the submittal to the Oklahoma Department of Environmental Quality a request for a sanitary sewer lagoon system permit to serve the Carlton Landing development. The lagoon system is located in Section 31, T9N, R17E, I.M. Please continue to review so that the permit can be obtained.

Respectfully submitted,

Grant Humphreys, CEO
***The Humphreys Company, Manager,
Humphreys Partners 2009, LLC***

TWJ/lh
Attachment(s)

CC:
[Project # / Ltr]

RECEIVED

JUL 30 2010

DEQ ECLS

Engineer's Report
Carlton Landing Total Retention Sanitary Sewer Lagoon

1. Volume and Strength of Sewage Flow

The lagoon system at Carlton Landing is divided into 5 different cells covering approximately 12 acres. The first 3 cells will be built now and the other 2 will be constructed in the future as homes continue to be built. The first 3 cells are designed for the capacity of 115 homes with the later 2 cells containing 135 additional homes. The lagoon cells will have a polyethylene liner (minimum 30mm) to prevent any seepage into the ground.

The load was determined using an average daily flow of 250 gal/day per home. The total retention lagoon system is designed to have a 3' depth in all ponds during normal conditions. There is an additional 5' of freeboard to accommodate any extra peak flows during holidays and summer months being that most of the homes will be seasonal or second homes.

See Appendix A for the inflow and size calculations.

2. Existing System

Currently there is not a sanitary sewer system. This is a new development with a total retention lagoon system rather than individual septic systems.

3. Project Description and Alternatives

This project will develop approximately 250 homes over the next 4-5 years and will use the lagoon as its sanitary sewer solution. After the development is more established and the lagoons have maximized their capacity a localized sewer treatment plant will be installed to accommodate all homes in the development and the lagoons will be removed.

See Appendix B for an overall site plan and a layout of the lagoon system.

4. Construction Sequence

- a) Clearing of existing ground of trees and large rocks
- b) Grading lagoon area to match the grades established by the engineer
- c) Placing polyethylene liner in lagoons to prevent any seepage into natural ground
- d) Installing inflow pipes to the lagoons and connection pipes for the lagoons in series.
- e) Constructing a chain link fence and gate to prevent unwanted access to the lagoon area.

5. Site

The site is located near Lake Eufaula in Pittsburg County. The terrain is very steep and heavily wooded in the lagoon area with slopes of up to 7-8% across the 12 acre lagoon site. The soil is mostly sand and sandstone.

See Appendix C for the soils report with boring logs and groundwater information.

6. Water Supply

Water in the area is close by, Lake Eufaula is located within a few hundred feet from the site. However, there are no active water wells on the property.

7. Receiving Stream

The sanitary sewer lagoon system is designed to be a total retention lagoon system. There will not be any discharge into a receiving stream or body of water.

8. Sewage Sludge Disposal

Any sludge that needs to be removed in the ponds will do so in accordance with ODEQ specifications. (OAC 252:606 & OAC 252:515)

9. Industrial Wastes

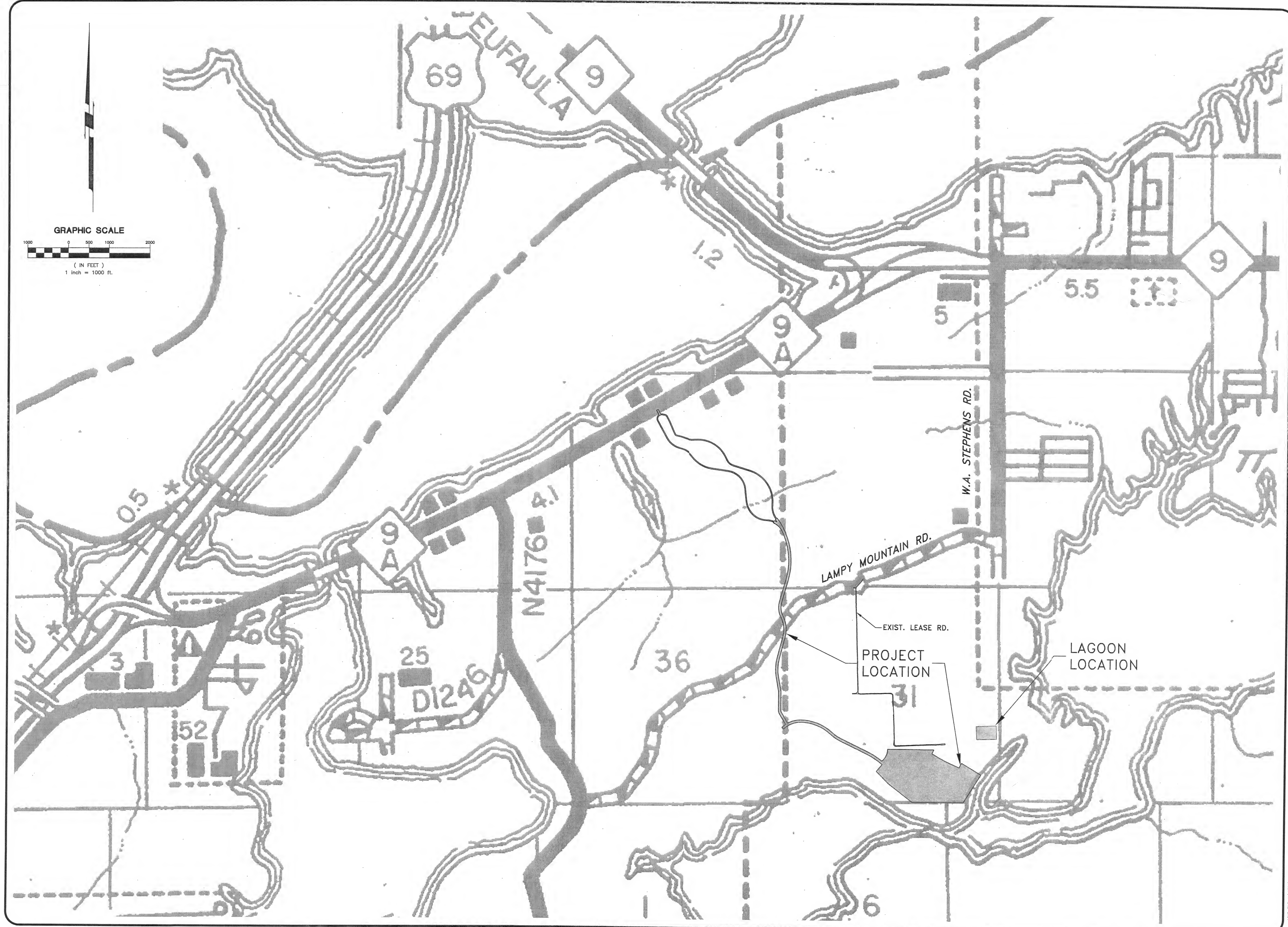
There shall not be any industrial wastes that enter the lagoon system. All of the flow will be from domestic use.

10. Collection System

The area will be served by a private sewer system that is gravity fed to a lift station that pumps the sewage to the lagoon site.

11. Financing

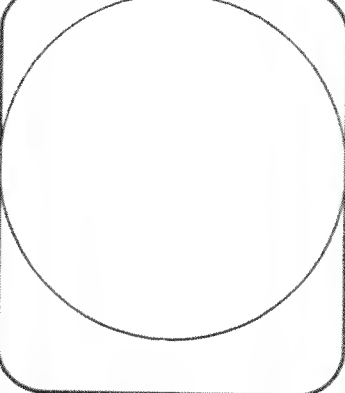
The estimated cost to construct the lagoon system is approx \$300,000. It will be paid for and maintained by the private developer of Carlton Landing.



GRAPHIC SCALE
(IN FEET)
1 inch = 1000 ft.

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REVISIONS	
NO.	DESCRIPTION



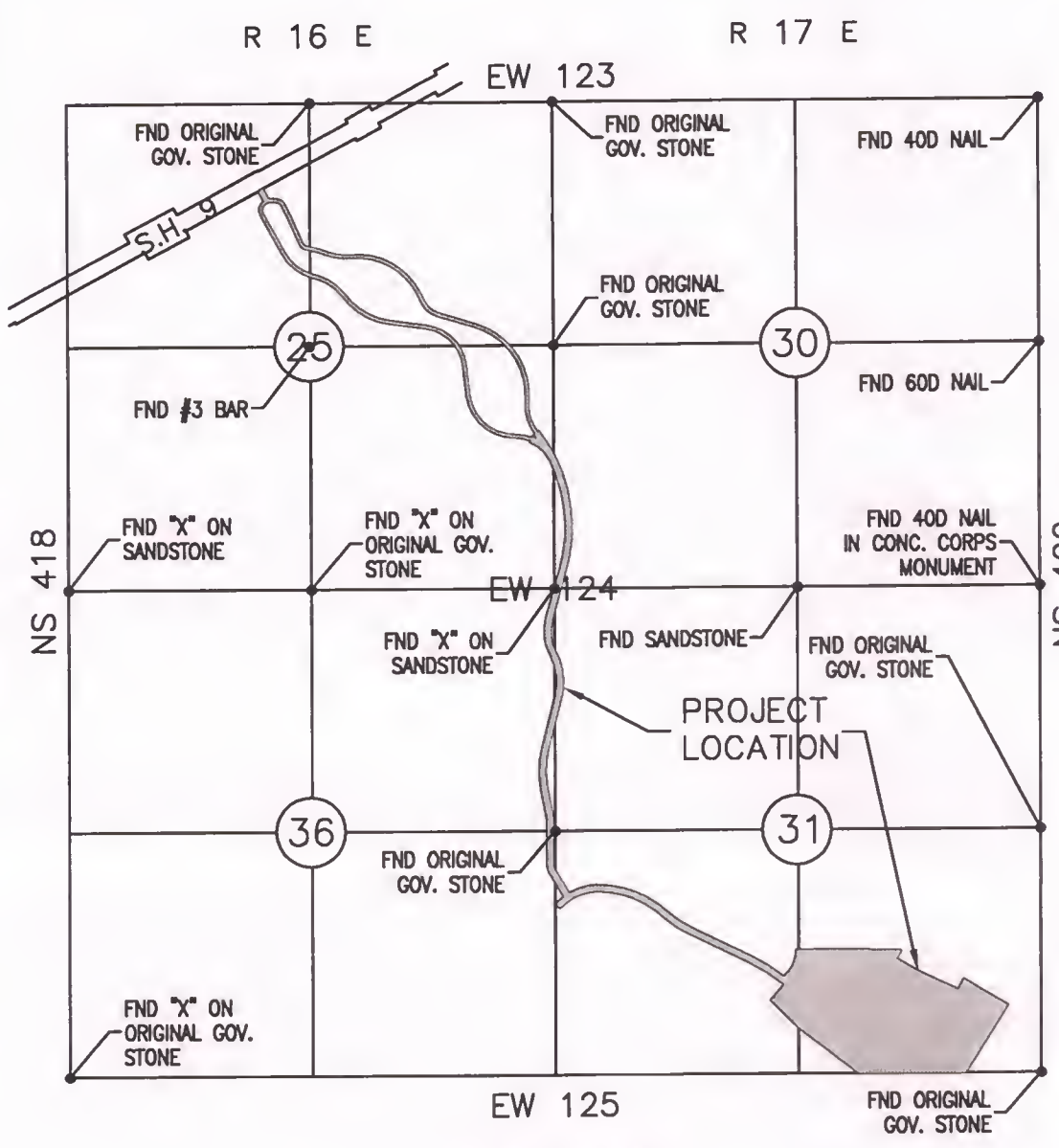
Johnson & Associates, Inc.
100 E. California Ave. - Third Floor
Oklahoma City, OK 73104
(405) 235-5075 FAX (405) 235-5078
Certificate of Authorization #1484 Exp. Date: 06-30-2011
• ENGINEERS • SURVEYORS • PLANNERS •



CARLTON LANDING PHASE 1
LAKE EUFAULA, PITTSBURG COUNTY, OKLAHOMA
LOCATION MAP

Proj. No.:
Date: 05-13-10
Scale: 1" = 1000'
Checked By: _____
Approved By: _____

SHEET NUMBER
LM



LOCATION MAP
SCALE: 1"=2000'

FINAL PLAT

of

CARLTON LANDING PHASE 1

BEING A PART OF THE NW/4, THE NE/4, AND THE SE/4 OF SECTION 25, AND A PART OF THE NE/4 AND THE SE/4 OF SECTION 36, T9N, R16E OF THE I.B.M., AND BEING A PART OF THE SW/4 OF SECTION 30, AND A PART OF THE NW/4, THE SW/4, AND THE SE/4 OF SECTION 31, T9N, R17E OF THE I.B.M.

AN ADDITION TO PITTSBURG COUNTY, OKLAHOMA

LINE TABLE			LINE TABLE		
LINE	LENGTH	BEARING	LINE	LENGTH	BEARING
L1	15.00'	N29°26'02"E	L33	34.44'	S12°00'26"E
L2	60.00'	S60°33'58"E	L34	26.84'	S27°38'53"E
L3	15.00'	S29°26'02"W	L35	15.00'	N29°26'02"E
L4	34.44'	S12°00'26"E	L36	0.84'	S60°33'58"E
L5	26.84'	S27°38'53"E	L37	63.95'	N88°25'31"E
L6	31.62'	S66°39'35"W	L38	29.42'	S03°37'09"E
L7	28.78'	N47°43'11"W	L39	30.00'	S65°05'52"E
L8	38.25'	N37°51'38"E	L40	30.00'	N32°22'46"E
L9	23.71'	S55°15'40"E	L41	26.51'	N35°49'43"W
L10	27.06'	N34°44'20"E	L42	42.68'	N34°58'10"E
L11	12.81'	S55°15'40"E	L43	15.00'	S31°20'07"E
L12	26.39'	N88°25'32"E	L44	25.49'	N56°37'06"W
L13	30.13'	S70°06'30"E	L45	30.45'	N38°10'06"W
L14	25.00'	N88°25'32"E	L46	30.02'	N22°13'19"E
L15	108.12'	N29°17'12"E	L47	30.15'	S80°54'43"E
L16	60.00'	N60°33'58"W	L48	34.25'	S13°46'04"E
L17	1.91'	N01°22'23"W	L49	59.95'	N17°20'52"E
L18	15.00'	S08°15'13"W	L50	59.95'	N16°31'31"E
L19	24.41'	N81°44'47"W	L51	30.00'	S73°03'49"E
L20	24.00'	N31°02'44"W	L52	22.35'	N66°39'47"E
L21	43.13'	N02°57'02"W	L53	28.95'	S32°56'44"E
L22	43.52'	N58°55'47"E	L54	15.81'	S32°22'46"E
L23	47.48'	N88°25'32"E	L55	23.03'	N48°34'36"E
L24	15.01'	S58°13'03"E	L56	30.44'	N38°09'37"W
L25	36.78'	S17°49'50"E	L57	30.02'	N22°13'19"E
L26	106.00'	N31°55'19"E	L58	30.15'	S80°54'43"E
L27	20.59'	N31°02'44"W	L59	11.43'	S13°46'04"E
L28	21.14'	S64°08'10"W	L60	24.00'	N28°06'46"E
L29	22.68'	N13°46'04"W	L61	24.00'	S60°52'10"E
L30	29.80'	N79°16'13"E	L62	24.00'	S60°52'10"E
L31	21.48'	S26°22'50"E	L63	5.91'	N28°48'23"E
L32	20.52'	S57°33'27"W	L64	46.91'	N27°58'33"E

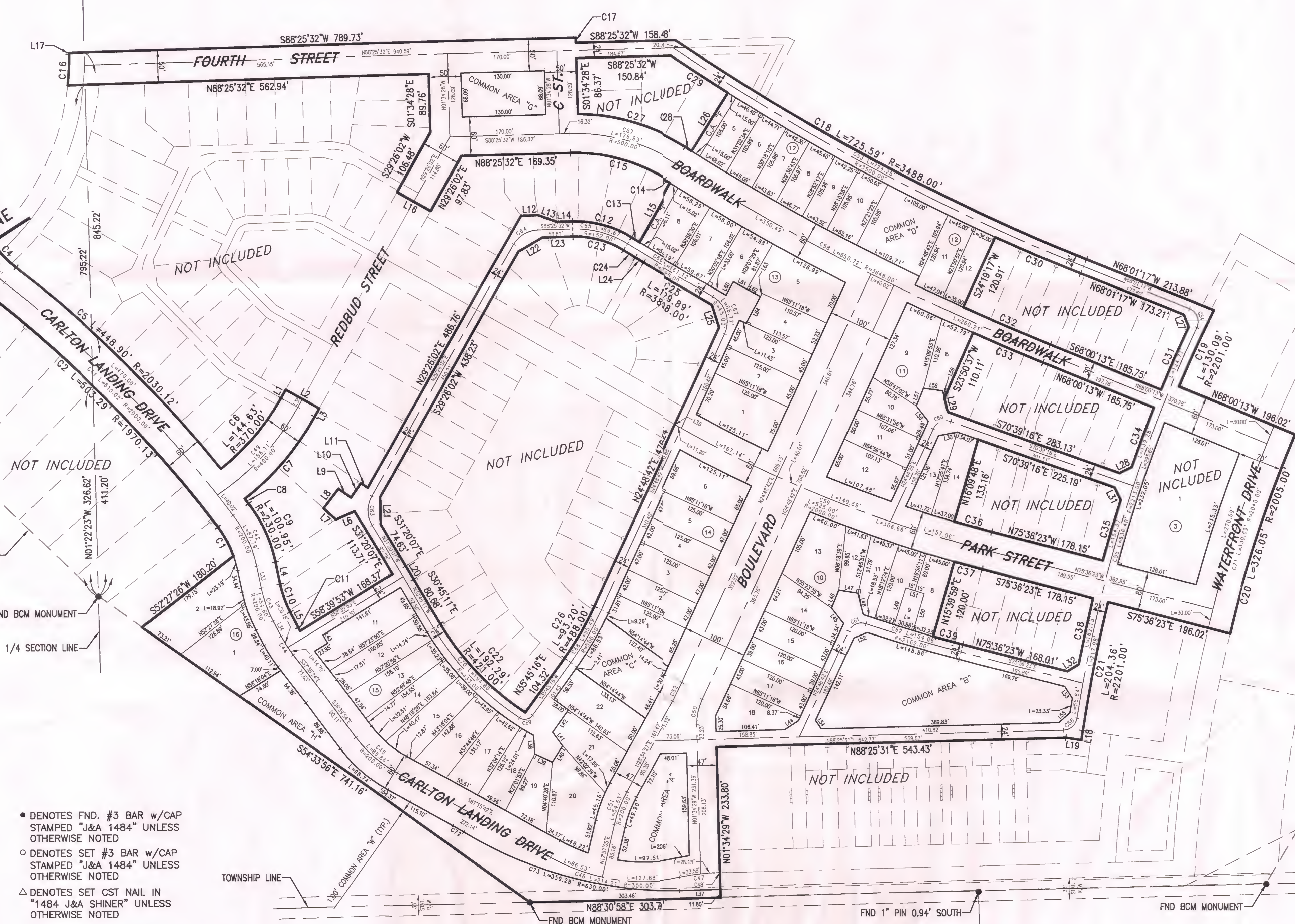
CURVE TABLE			CURVE TABLE		
CURVE	LENGTH	RADIUS	CURVE	LENGTH	RADIUS
C1	51.43'	170.00'	C27	10.87'	350.00'
C2	503.29'	1970.13'	C28	10.87'	350.00'
C3	74.55'	230.00'	C29	10.87'	350.00'
C4	55.10'	170.00'	C30	10.87'	350.00'
C5	448.90'	2030.12'	C31	10.87'	350.00'
C6	144.63'	370.00'	C32	10.87'	350.00'
C7	167.98'	430.00'	C33	10.87'	350.00'
C8	9.45'	2030.00'	C34	10.87'	350.00'
C9	100.95'	230.00'	C35	10.87'	350.00'
C10	46.41'	170.00'	C36	10.87'	350.00'
C11	6.25'	170.00'	C37	10.87'	350.00'
C12	96.75'	164.00'	C38	10.87'	350.00'
C13	14.61'	3784.00'	C39	10.87'	350.00'
C14	9.21'	3678.00'	C40	10.87'	350.00'
C15	159.24'	421.00'	C41	10.87'	350.00'
C16	48.24'	375.00'	C42	10.87'	350.00'
C17	8.00'	3370.00'	C43	10.87'	350.00'
C18	725.59'	3488.00'	C44	10.87'	350.00'
C19	130.09'	2201.00'	C45	10.87'	350.00'
C20	326.05'	2005.00'	C46	10.87'	350.00'
C21	204.36'	2201.00'	C47	10.87'	350.00'
C22	192.22'	421.00'	C48	10.87'	350.00'
C23	82.59'	140.00'	C49	10.87'	350.00'
C24	21.96'	3808.00'	C50	10.87'	350.00'
C25	129.89'	3808.00'	C51	10.87'	350.00'
C26	93.20'	488.00'	C52	10.87'	350.00'
C27	180.94'	330.00'	C53	10.87'	350.00'
C28	11.75'	3618.00'	C54	10.87'	350.00'
C29	105.91'	3512.00'	C55	10.87'	350.00'
C30	144.25'	3512.00'	C56	10.87'	350.00'
C31	106.03'	2334.07'	C57	10.87'	350.00'
C32	147.43'	3633.00'	C58	10.87'	350.00'
C33	118.09'	3663.00'	C59	10.87'	350.00'
C34	98.40'	2225.00'	C60	10.87'	350.00'
C35	98.40'	2225.00'	C61	10.87'	350.00'
C36	60.85'	1970.00'	C62	10.87'	350.00'
C37	45.09'	2030.00'	C63	10.87'	350.00'
C38	105.11'	2225.00'	C64	10.87'	350.00'
C39	47.76'	2149.56'	C65	10.87'	350.00'
C40	65.63'	200.00'	C66	10.87'	350.00'
C41	510.02'	2000.00'	C67	10.87'	350.00'
C42	87.73'	200.00'	C68	10.87'	350.00'
C43	54.60'	200.00'	C69	10.87'	350.00'
C44	34.88'	200.00'	C70	10.87'	350.00'
C45	85.86'	200.00'	C71	10.87'	350.00'
C46	214.21'	300.00'	C72	10.87'	350.00'
C47	61.76'	300.00'	C73	10.87'	350.00'
C48	184.14'	1543.16'			
C49	184.14'	1543.16'			
C50	41.45'	60.00'			
C51	54.53'	200.00'			
C52	32.83'	500.00'			
C53	724.25'	3500.00'			
C54	35.80'	22.00'			
C55	636.40'	2213.00'			
C56	30.59'	22.00'			
C57	178.93'	300.00'			
C58	650.72'	3648.00'			
C59	525.00'	2000.00'			
C60	32.49'	22.00'			
C61	32.13'	22.00'			
C62	154.06'	2162.00'			
C63	47.73'	45.00'			
C64	46.33'	45.00'			
C65	89.67'	152.00'			
C66	161.12'	3796.00'			
C67	66.77'	45.00'			
C68	95.49'	500.00'			
C69	22.96'	15.00'			
C70	194.80'	433.00'			
C71	330.69'	2040.00'			
C72	19.37'	470.00'			
C73	359.28'	630.00'			

LEGEND:

P.O.C. = POINT OF COMMENCEMENT
P.O.B. = POINT OF BEGINNING
NR = NOT RADIAL
B/L = BUILDING LIMIT LINE
D & U/E = DRAINAGE & UTILITY EASEMENT
U/E = UTILITY EASEMENT
D/E = DRAINAGE EASEMENT
L.N.A. = LIMITS OF NO ACCESS
C.A. = COMMON AREA

***** NOTE *****

THIS SURVEY MEETS THE OKLAHOMA MINIMUM STANDARDS FOR THE PRACTICE OF LAND SURVEYORS AS ADOPTED BY THE OKLAHOMA STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS, AND THAT SAID FINAL PLAT COMPLIES WITH THE REQUIREMENTS OF TITLE 11 SECTION 41-108 OF THE OKLAHOMA STATE STATUTES.



FINAL PLAT of CARLTON LANDING PHASE 1

Johnson & Associates, Inc.
1 E. Sheridan Ave., Suite 200
Oklahoma City, OK 73104
(405) 235-8075 FAX (405) 235-8078
Certificate of Authorization #1484 Exp. Date: 06-30-2011
ENGINEERS • SURVEYORS • PLANNERS

APPENDIX A

Carlton Landing Lagoon Sizing

Inflow:

From Homes (250 homes @ 250 gal/day):

Phase 1 (# of homes)	115
Phase 2 (# of homes)	135
Total inflow (gal/day)	62500
Total inflow (ft ³ /day)	8355

For Pittsburg
Randy:

3,049,575 ft³/yr

55.66 59.27

From Precipitation:

Precipitation (in/yr)	46.2
Precipitation (ft/yr)	3.85
Precipitation (ft/day)	0.0105

1.311

1.195' net evap/yr

1.2

Outflow:

From Evaporation:

Evaporation (in/yr)	75 70
Evaporation (ft/yr)	6.25
Evaporation (ft/day)	0.017

15

Calculations:

$$\frac{8355 \frac{\text{ft}^3}{\text{day}}}{43560 \frac{\text{ft}^2}{\text{acre}}} = \left[0.1918 \frac{\text{acre} \cdot \text{ft}}{\text{day}} \right] + \left[0.0105 \frac{\text{ft}}{\text{day}} \right] = \underline{\underline{0.2023 \frac{\text{acre} \cdot \text{ft}}{\text{day}}}}$$

$$\text{Total lagoon sizing} = \frac{0.2023 \frac{\text{acre} \cdot \text{ft}}{\text{day}}}{0.017 \frac{\text{ft}}{\text{day}}} = \underline{\underline{11.9 \text{ acres}}}$$

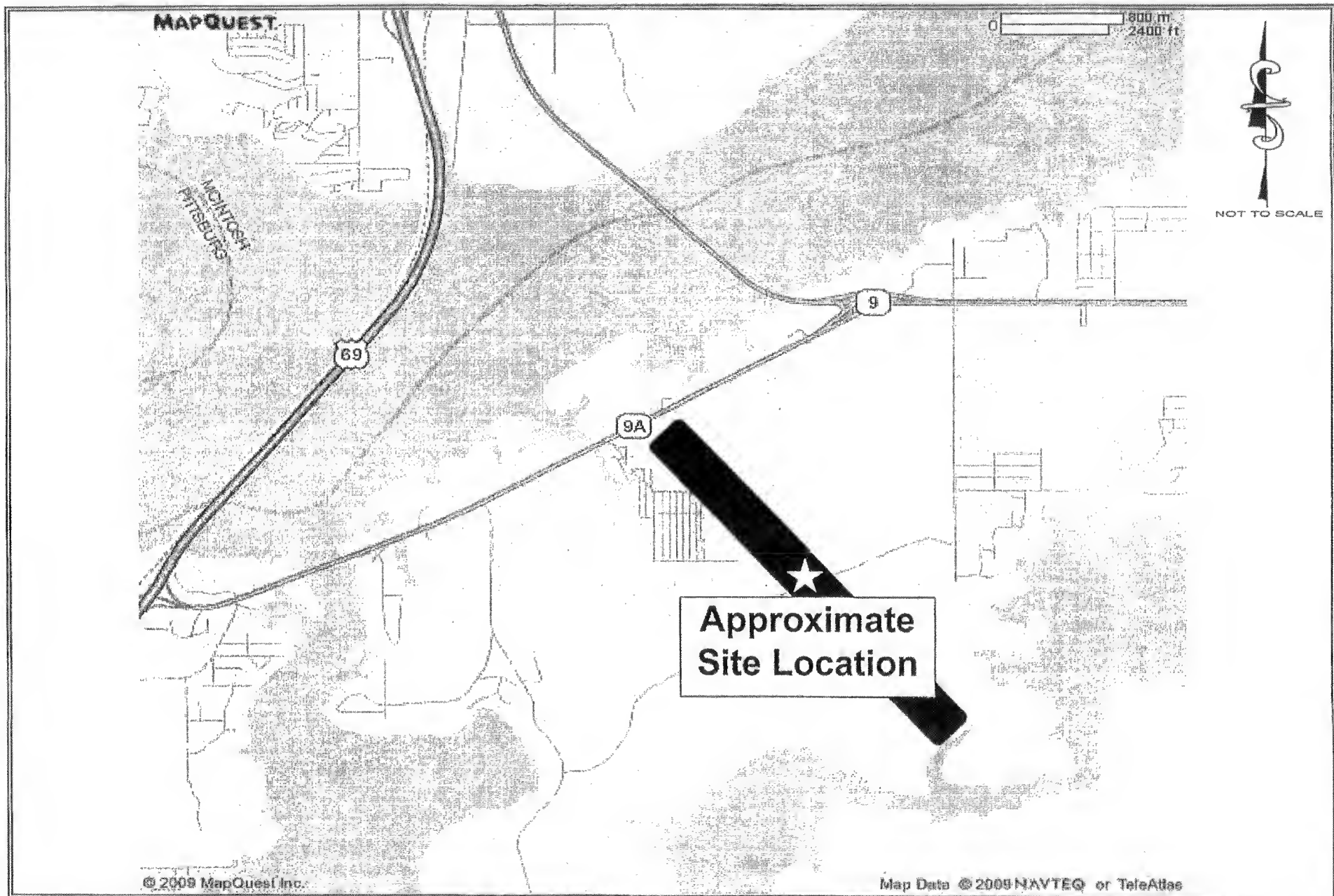
53.3 acres

58

Phase	Storage (acres)
1 (Ponds A, B, & C)	5.5
2 (Ponds D & E)	6.4

APPENDIX B

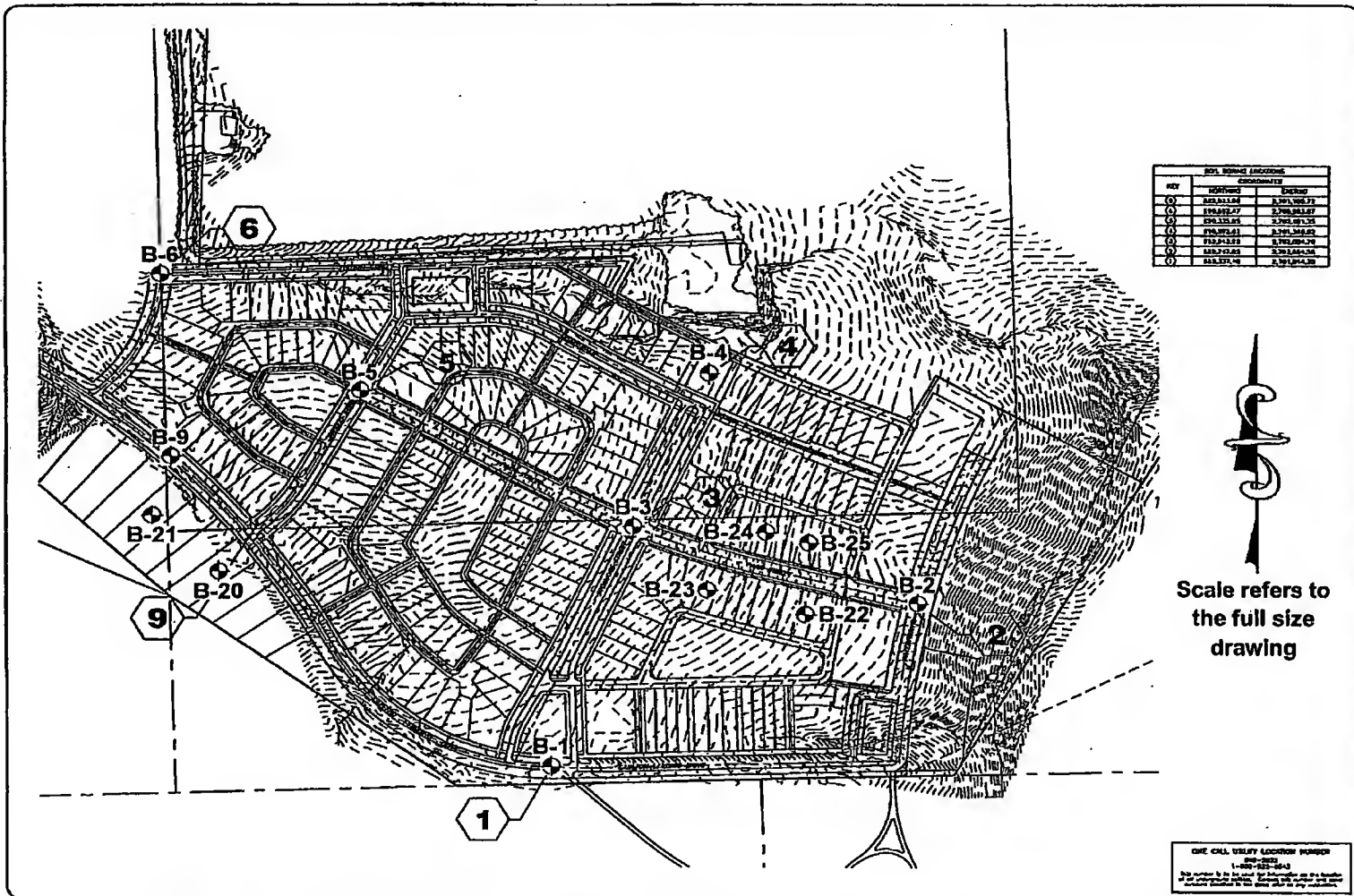
APPENDIX C



Vicinity Map

Project Name: Carlton Landing Geotechnical Investigation and Pavement Recommendations
Project Location: Pittsburg County, Oklahoma
Project No.: 2309-3149

**STANDARD
TESTING**
AND ENGINEERING COMPANY



DATE: _____

PROJECT: _____

PROJECT NUMBER: _____

CARLTON LANDING PHASE 1
USE DALLAS, PITTSBURG COUNTY, OKLAHOMA
BORING PLAN

2

Site and Boring Location Plan

Project Name: Carlton Landing Geotechnical Investigation and Pavement Recommendations
 Project Location: Pittsburg County, Oklahoma
 Project No.: 2309-3149

**STANDARD
TESTING**
AND ENGINEERING COMPANY



STANDARD TESTING AND ENGINEERING COMPANY

SOIL BORING LOG

Boring No. B-6

Project: Carlton Landing GI & Pavement Recommendations

Project No.: 2309-3149

Project Location: Pittsburg County, Oklahoma

Date Drilled.: 12/1/09

Boring Location: Lat: 35.20647625; Lon: -95.54816033

Project Engineer: Jieliang Pan, P.E.

Drill Method: CME w/ 4" Solid Flight Auger

Field Logger: Johnny Jarman

Surface Elevation: 685.920 feet

Water Depth: Dry @ Completion

Remarks: Ground elevation provided by client

Elev./Depth Feet	Symbol	Samples	SPT Blows/ Increment	Soil Description	Dry Density (pcf)	% Passing #200 Sieve	Moisture/Plasticity	
							PL	LL
0							10 20 30 40 50 60	
685				Tan Brn. SILTY SANDSTONE V. Moist, Nonplastic USCS: SM; AASHTO: A-4(0)		39.6	10 20 30 40 50 60	
2.5								
682.5								
5								
680								
7.5								
677.5								
10								
675								
12.5								
672.5								
15								
670								

SOIL BORING LOG

Boring No. B-7

Project: Carlton Landing GI & Pavement Recommendations

Project No.: 2309-3149

Project Location: Pittsburg County, Oklahoma

Date Drilled.: 12/1/09

Boring Location: Lat: 35.21010719; Lon: -95.54810580

Project Engineer: Jieliang Pan, P.E.

Drill Method: CME w/ 4" Solid Flight Auger

Field Logger: Johnny Jarman

Surface Elevation: 724.*** feet

Water Depth: Dry @ Completion

Remarks: Ground elevation provided by client

Elev./Depth Feet	Symbol	Samples	SPT Blows/ Increment	Soil Description	Dry Density (pcf)	% Passing #200 Sieve	Moisture/Plasticity					
							PL	20	30	40	50	60
							Water Content, % -					
							10	20	30	40	50	60
0				Brn. SILTY SAND w/ Gravel V. Moist, Nonplastic								
722.5				Brn. SILTY SANDSTONE Moist, Nonplastic USCS: SM; AASHTO: A-4(0)		39.2						
2.5												
720												
5												
717.5												
7.5												
715												
10												
712.5												
12.5												
710												
15												
707.5												

SOIL BORING LOG

Boring No. B-8

Project: Carlton Landing GI & Pavement Recommendations

Project No.: 2309-3149

Project Location: Pittsburg County, Oklahoma

Date Drilled.: 12/1/09

Boring Location: Lat: 35.21018976; Lon: -95.55095354

Project Engineer: Jieliang Pan, P.E.

Drill Method: CME w/ 4" Solid Flight Auger

Field Logger: Johnny Jarman

Surface Elevation: 765.*** feet

Water Depth: Dry @ Completion

Remarks: Ground elevation provided by client

Elev./Depth Feet	Symbol	Samples	SPT Blows/ Increment	Soil Description	Dry Density (pcf)	% Passing #200 Sieve	Moisture/Plasticity										
							PL	10	20	30	40	50	60	LL	Water Content, % -		
765	0			Tan Brn. SILTY SANDSTONE Moist, Nonplastic USCS: SM; AASHTO: A-2-4		26.5											
762.5	2.5																
760	5																
757.5	7.5																
755	10																
752.5	12.5																
750	15																

SOIL BORING LOG

Boring No. B-10

Project: Carlton Landing GI & Pavement Recommendations

Project No.: 2309-3149

Project Location: Pittsburg County, Oklahoma

Date Drilled.: 12/1/09

Boring Location: Lat: 35.21735691; Lon: -95.55104095

Project Engineer: Jieliang Pan, P.E.

Drill Method: CME w/ 4" Solid Flight Auger

Field Logger: Johnny Jarman

Surface Elevation: 758.441 feet

Water Depth: Dry @ Completion

Remarks: Ground elevation provided by client

Elev./Depth Feet	Symbol	Samples	SPT Blows/ Increment	Soil Description	Dry Density (pcf)	% Passing #200 Sieve	Moisture/Plasticity							
							PL						LL	
							10	20	30	40	50	60		
				Brn. & Dk. Brn. SILTY SAND w/ Gravel V. Moist, Nonplastic USCS: SM; AASHTO: A-4(0)		47.1								
				Tan Brn. SILTY SANDSTONE Moist, Nonplastic										
				Auger Refusal @ 2 ft.										

SOIL BORING LOG

Boring No. B-11

Project: Carlton Landing GI & Pavement Recommendations

Project No.: 2309-3149

Project Location: Pittsburg County, Oklahoma

Date Drilled.: 12/1/09

Boring Location: Lat: 35.21384975; Lon: -95.55097046

Project Engineer: Jieliang Pan, P.E.

Drill Method: CME w/ 4" Solid Flight Auger

Field Logger: Johnny Jarman

Surface Elevation: 771.951 feet

Water Depth: Dry @ Completion

Remarks: Ground elevation provided by client

Elev./Depth Feet	Symbol	Samples	SPT Blows/ Increment	Soil Description	Dry Density (pcf)	% Passing #200 Sieve	Moisture/Plasticity						
							PL						LL
							10	20	30	40	50	60	
Water Content, % - ●													
							10	20	30	40	50	60	
0				Tan Brn. SILTY SAND w/ Gravel V. Moist, Nonplastic									
770				Tan Brn. SILTY SANDSTONE V. Moist, Nonplastic									
2.5				USCS: SM; AASHTO: A-2-4		34.3							
267.5													
5													
765													
7.5													
762.5													
10													
760													
12.5													
757.5													
15													
755													